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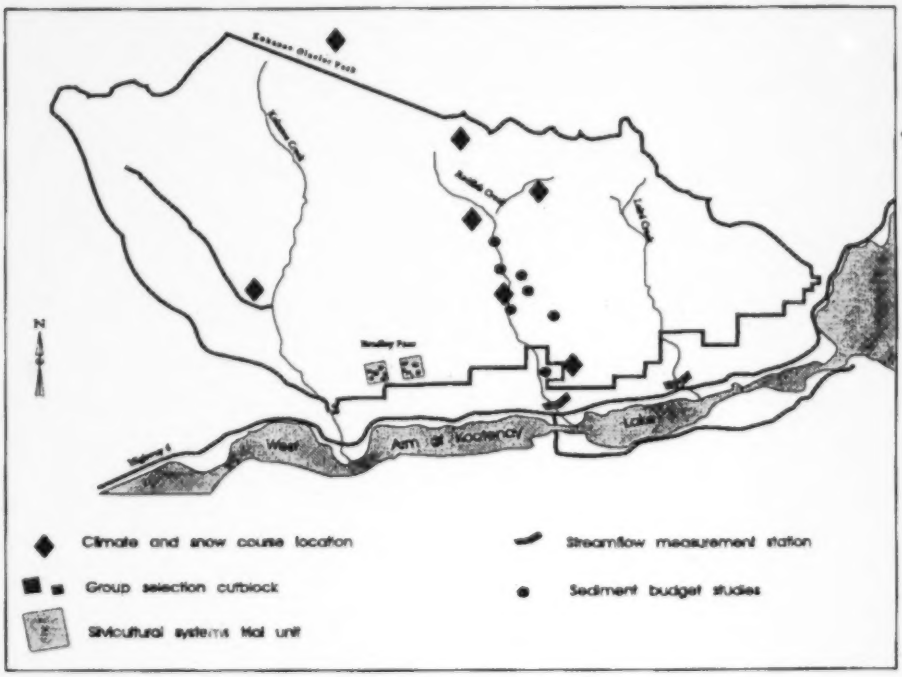
RESEARCH SUMMARY

forest sciences
NELSON FOREST REGION

Mar. 1995 RS-018

The West Arm Demonstration Forest – Research Update

■ summary of completed and ongoing research



INTRODUCTION

The West Arm Demonstration Forest (WADF) was created in response to local public concern with current forest management practices. The Demonstration Forest is a 145 km^2 area (approx. 13,500 ha) that provides excellent opportunities for studying a broad range of forest values. It also allows a variety of new and innovative forest management approaches and techniques to be tested at an operational level.

Research activities at WADF range from studies and inventories of various forest components, to trials of innovative harvesting methods. The results and findings of these activities will enable forest managers to better accommodate ecological and social values, while allowing for resource extraction.

This research update provides summaries of completed and ongoing research projects in WADF. The summaries are categorized into landscape level and stand level projects.

LANDSCAPE LEVEL PROJECTS

Landscape level projects look at WADF as a whole, rather than taking only a specific study area into consideration. Many of these landscape level projects are required in order to complete forest use plans for WADF.

1. Public Survey
"Baseline Survey of Community Values"
Appropriate Forest Services, Kaslo, B.C.
For copies of report: 354-6285

Ecology • Geomorphology • Hydrology • Pedology • Silviculture • Silvicultural Systems

This survey was conducted in the communities near WADF in March 1991. Objectives of the survey were (i) to gain input on community values to ensure that development in WADF is consistent with community concerns, and (ii) to ensure that forest managers are aware of these concerns when planning forest use activities. One hundred questionnaires were completed and summarized, and a report is available.

2. Timber Supply
"Implications of Alternative Silvicultural Strategies on Timber Supply in the West Arm Demonstration Forest"
Reid, Collins and Associates, Vancouver, B.C.
Peter Lewis, MOF, Kootenay Lake, 825-1100

The objective of this analysis is to evaluate the implications of alternative silvicultural strategies (i.e. clearcut logging or some type of partial cutting) on the timber supply available from WADF. This report provides guidelines for choosing a silvicultural strategy. The report is the first step in a continuing process that ultimately will develop yield tables, harvest layouts, road plans, and cost and revenue estimates for various harvesting alternatives. The process will also use computer models to schedule harvesting and evaluate economic and environmental impacts.

3. Total Resource Design
Total Resource Design in the WADF
Larry Price, MOF, Nelson, 354-6200

Total Resource Design (TRD) is a planning technique that considers the ecological functioning of the landscape, its visual character and other resource uses and values in the area. The TRD approach recommends designing activities to mimic natural disturbance patterns while also incorporating social needs and concerns. The TRD concept was developed jointly in England and Washington State.

The application of Total Resource Design in WADF in January 1994 was a first in B.C. The West Arm Demonstration Forest landscape was analyzed, and divided up into smaller treatment units. Currently a computer simulation model is being used to coordinate this design with a harvesting schedule. The TRD process is described in a Master's Thesis titled *"Total Resource Design: Documentation of a method and a discussion of its potential for application in British Columbia"*, completed by Julie Duff (UBC, 1994).

4. Ecosystem Sustainability
"Analysis and Calculations for Sustainable Forest Ecosystem Management"
E. David Ford, University of Washington,
Owen Hamel, U. of Washington, (206) 685-1391

This ongoing project will allow foresters to assess whether the forest management policies prescribed for WADF are ecologically sustainable. The researchers will develop a series of calculations to determine whether the objectives or desired yields from the forest (timber, wildlife habitat, scenery, etc.) can be met without endangering the long-term ability of the forest to continue providing these yields. The project will develop a mechanism for changing management policies if current ones are shown to be non-sustainable, or if objectives change.

5. Climatic Installations
"West Arm Demonstration Forest Climate and Snow Monitoring"
David R. Gluns, MOF, Nelson, 354-6200

This ongoing long-term project describes climate and snow conditions in WADF. Seven climate stations and seven snow survey locations have been established in WADF and Kokanee Glacier Park. Hourly and daily climate data are being collected and is summarized monthly and yearly. Snow surveys are done during snow accumulation and melt periods to determine snow water equivalents. All data are in digital format and is available to researchers working in WADF.

6. Forest Development Plan
Jim Schafthuizen, MOF, Kootenay Lake, 825-1100
Jim Annunziello, MOF, Kootenay Lake.

The Forest Development Plan for WADF is prepared by the Small Business Program of the Ministry of Forests. The plan details harvest blocks and prescriptions proposed for WADF for a five year period. The plan incorporates information taken from a number of sources including the Timber Supply Analysis, the Total Resource Design, and the Public Survey.

7. Extension Project
Deb DeLong, MOF, Nelson, 354-6200

This is an ongoing project to develop a long-term plan for extension activities at WADF. The program is aimed at both a forestry audience and the general public. This year's focus is on interpretive signs, brochures and trails in the Kokanee Creek and Bradley Face areas.

STAND LEVEL PROJECTS

Rather than looking at the demonstration forest as a whole, stand level projects take place on specific areas within WADF. Some of these projects cover large areas (i.e. the sedimentation study), whereas others occur only at very localized sites.

At present, much of the stand level research being done at WADF is in the Bradley Face area where logging is currently underway on a silvicultural systems trial. The trial will test the effects of small group selection cuts on various forest components. The trial includes two unlogged 30 ha. control units, and two harvest units each with six small cutblocks (0.5 to 1.8 ha.). Clumps of wildlife trees have been retained in each cutblock (up to 30 trees/ha.). Harvesting started in January 1995, using a small cat to protect soil and residual trees. It is scheduled for completion by March 1995. Projects listed below that are marked with an asterisk (*) are taking place at the Bradley Face silvicultural systems trial location.

***1. Wildlife Diversity**
"Monitoring changes in wildlife diversity during silvicultural systems trials - group selection in the West Arm Demonstration Forest"
L.M. Darling, MOELP, Victoria, 387-9762

The first phase of this long-term study has been completed. Point count surveys and live-trapping techniques were used to inventory and monitor bird and small mammal populations, prior to group selection harvesting at Bradley Face. Also, security cover was estimated, and an inventory of coarse woody debris and

wildlife trees was completed. The area will be resurveyed in 1995 following completion of harvesting, and in subsequent years.

***2. Furbearer Habitat Use**
"Impacts of partial cutting silvicultural systems on furbearer distribution and habitat use in the West Arm Demonstration Forest"
Al Soobotin, MOELP, Nelson, 354-6354
L.M. Darling and Eric Lotroth, MOELP, Victoria

In a study funded by Forestry Canada (FRDA II), winter tracking, trailing and trapping were used to document the relative abundance, habitat use and food habits of small furbearers on the Bradley Face. Changes in furbearer populations following logging will be related to changes in small rodent populations, and vegetation and habitat structure. Of particular interest will be changes in the quality and quantity of coarse woody debris since furbearers appear to be heavily reliant on this ecosystem component for shelter and other uses.

***3. Beetles**
"Carabid Biodiversity Study"
A.J. Stock, MOF, Nelson, 354-6200

This study was initiated to collect background information about the species diversity of Carabid beetles in the Bradley Face area of WADF. These beetles are considered useful indicators of forest conditions and environmental change. A pre-harvest inventory was completed in the group selection area, and further monitoring is planned in 1995 following logging. Beetle populations will also be monitored in undisturbed areas adjacent to cutblocks. This will help researchers to determine the effects of small patch cutblocks on beetle populations.

4. Bats
"Impacts of Forest Harvesting on the Distribution, Abundance, and Foraging and Roosting Behaviour of Bats in the West Arm Demonstration Forest (WADF) near Nelson, B.C."
Dr. R.M. Brigham , U. of Regina, (306) 585-4145
Dr. R.M.R. Barclay, U. of Calgary, (403) 289-9311

This ongoing project is the first study in B.C. to examine the impact of forest harvesting on bats. An inventory of bat populations was conducted on a large number of sites throughout WADF. The foraging and roosting habits of the bats were evaluated using ultrasonic detectors and radio-telemetry. In order to gain information about the effects of harvesting on bats, the study looked at both unlogged and previously harvested areas to see if there were significant differences in bat populations or activities. The results of this inventory are presented in the report cited above.

*An ongoing part of the study is focused on the Bradley Face silvicultural systems trial area. Researchers are using this location to test the effects of various cutting patterns on habitat use and foraging activities of bats. To date, the pre-harvest data for Bradley face has been collected and post-harvest data will be collected in the summer of 1995. A final report is scheduled for February 1996.

5. Wildlife Trees
"Wildlife Tree Research in the West Arm Demonstration Forest"
Christoph Steeger, Pandion Ecological Research Ltd.,
Ymir, B.C. 357-2246

In 1992, a wildlife tree and cavity-nesting bird study was initiated on three sites in different biogeoclimatic zones in WADF. The main study objectives are (i) to examine existing wildlife tree habitat and its functional significance for cavity-nesters, and (ii) to develop criteria and guidelines for wildlife tree management in B.C. Interior forest ecosystems. The next phase of the study will focus on (i) the effects of harvesting on wildlife tree users and (ii) the ecological roles of forest health agents, wildlife trees, and wildlife species within forest ecosystems. The project is anticipated to continue for a minimum of 3 years.

6. Stream Sedimentation
"Sediment Budget of Watersheds in the West Arm Demonstration Forest"
Peter Jordan, MOF, Nelson, 354-6200
Paul Commandeur, Canadian Forest Service, Victoria

This study was initiated in 1992 to collect information about the impacts of forest harvesting and road building on the quality of water in community watersheds. The study monitors two creeks of similar size and hydrologic character in the WADF area (Redfish Ck. and Laird Ck.). The watershed of one of these creeks is unlogged whereas the other has been harvested fairly extensively. Water monitoring stations were set up on both creeks and measurements are being taken on a regular basis. This 10 year study will provide information about sedimentation in water supplies, and the effects of different silvicultural systems and road engineering practices on sediment production. Interim results will be available in intervals of several years.

The proximity of WADF to the city of Nelson, and the accessibility of its diverse stands, are expected to attract numerous scientists who will engage in research in the area over the next decade.

For more information and copies of the above-mentioned reports, please contact:

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